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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,894	06/14/2001	Yukio Nishimura	5988-033-27	5802

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Supervisor, Patent Prosecution Services
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EXAMINER	
THORNTON, YVETTE C	

ART UNIT	PAPER NUMBER
1752	3

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/879,894	NISHIMURA ET AL.	
	Examin r	Art Unit	
	Yvette C. Thornton	1752	

-- *The MAILING DATE of this communicati n appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-16* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This is written in reference to application number 09/879894 filed on June 14, 2001 and published as U.S. 2002/0009668 on January 24, 2002.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

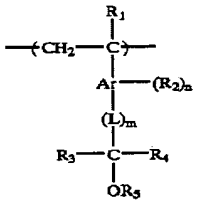
Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

3. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

4. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-3 and 12-13 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 37 and 41-43 of copending Application No. 09/794466 (US 2002/0164538 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other because both inventions pertain to a photoresist composition comprising an acid generator and a polymer having a recurring unit containing a fluorinated substituent. The prior art teaches a

monomer of formula (III) having the structure  wherein R_3 is a fluorinated alkyl; R_4 is H, alkyl or fluorinated alkyl; and R_5 is H, alkyl, protected hydroxyl, -C(O)R_8, -CH_2-, C(O)OR_8-, -C(O)OR_9- or -SiR_{10}-. The prior art further claims that the photoresist composition further comprises at least one additive such as an acid diffusion controlling agent and that the said acid generator is an onium salt. It would have been obvious to one of ordinary skill in the art, in light of the claimed invention of US 2002/0164538 A1, to make a photoresist composition comprising (1) a copolymer having a structure represented by -$CR_3R_4OR_5$ wherein R_3 is a fluorinated alkyl; R_4 is H, alkyl or fluorinated alkyl; and R_5 is H, alkyl, protected hydroxyl, -C(O)R_8, -CH_2-, C(O)OR_8-, -C(O)OR_9- or -SiR_{10}-; (2) an acid generator which is an onium salt; and (3) at least one additive such as an acid diffusion controlling agent. One of ordinary skill would have a reasonable expectation of success in preparing a composition with the claimed components of the invention of US 2002/0164538 A1.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

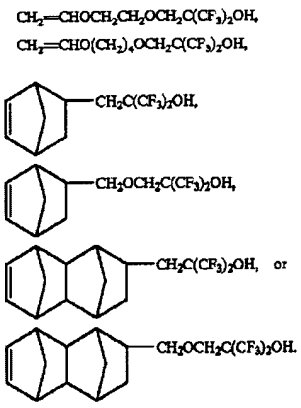
6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

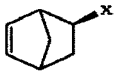
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.
>
> (f) he did not himself invent the subject matter sought to be patented.

7. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

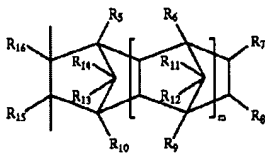
8. Claims 1-4, 12 and 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Fryd et al. (US 6503686 B1). Fryd claims a photoresist composition containing a nitrile/ fluoroalcohol copolymer and a photoactive component (cl. 1) wherein the fluoroalcohol repeating unit is derived from a monomer having the structural formula:



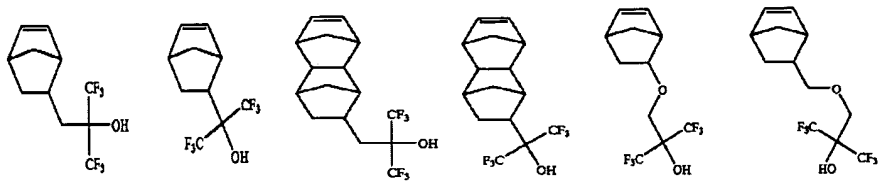
(cl. 31). It is the examiner's position that monomer 3 of said group of formulae (cl. 31) meets the limitations of claimed formula (2) wherein R_1 is hydrogen and m=1.

Fryd exemplifies in example 15 a composition comprising a polymer of acyrlonitrile/norbornylenehexafluoroalcohol/tertiarybutyl methacrylate (65/22/13); a t-butyl lithocholate as the dissolution inhibitor; and triphenylsulfonium nonaflate as the photoacid generator (c. 28, l. 25-61). Norbornylhexafluoroalcohol has the structure  wherein X is $OCH_2C(CF_3)_2OH$ (c. 15). See also examples 4, 5 and 7.

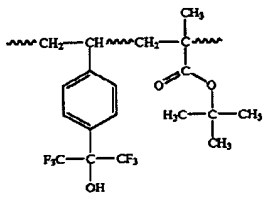
9. Claims 1-4 and 12-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Dammel et al. (US 2002/0187419 A1). Dammel claims a photoresist composition comprising a copolymer, a photoactive component and a solvent, where the copolymer comprises at least one ethylenic unit and at least one cyclic unit of the following structure:



(cl. 1, p. 0020). Illustrative examples of suitable cyclic comonomers

include  (p. 0022).

Example 2 exemplifies the synthesis of methyl 2-cyanoacrylate/norbornene hexafluorotertbutanol copolymer (p. 0040). It is the examiner's position that norbornene hexafluorotertbutanol as well as the preferred comonomers illustrated above meets the limitations of claimed formulae (1) and (2). Dammel further claims that the said composition further comprising a dissolution inhibitor (cl. 15) and a base compound (cl. 18-19). The photoactive compound can be a photoacid generator selected from the group consisting of diazonium salts, iodonium salts, sulfonium salts, sulfones, hydroxamic acid esters, halides and sulfonic esters (cl. 16-17).

10. Claims 1-3 and 12-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Allen et al. (US 2002/0164538 A1, 09/794466). Allen exemplifies in examples 13 and 14 a resist composition comprising a 50/50 copolymer of 4-(hexafluorohydroxyisopropyl)styrene and t-butyl-α-trifluoromethyl acrylate; bis-(t-butylphenyl)iodonium perfluorooctanesulfonate as the photoacid generator; tetrabutylammonium hydroxide as a base component; and PGMEA as a solvent (p. 0131-0141). Example 14 further comprises a dissolution modifying additive (p. 0098). The said copolymer has the following structure:  (p. 0084-0086). It is the examiner's position that the 4-(hexafluorohydroxyisopropyl)styrene monomer clearly anticipates the claimed formula (1-3) as set forth in the instant claims.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

11. Claims 1-3 and 12-13 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. The claimed subject matter of the present application is rendered obvious by copending application 09/794466 (US 2002/0164538) to Allen et al. (See items 5 and 10 above) The inventive entity of the copending application and the present application is different with the exception of one common inventor. It is therefore unclear to the examiner who invented the claimed invention. Clarification is requested.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

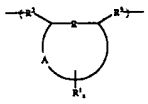
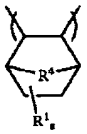
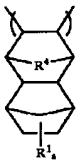
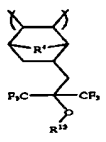
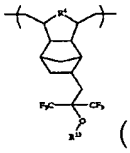
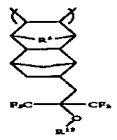
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dammel (US 2002/0187419 A1) as applied to claims 1-4 and 12-14 above. Dammel teaches all the limitation of the instant claims as discussed above, except it fails to exemplify a copolymer further comprising additional monomers as set forth in instant claims 5-7. Dammel does

however claim that the taught copolymer further comprises additional monomers such as (meth)acrylates, styrenes, hydroxystyrene, vinyl ethers, vinyl acetates, tetrafluoroethylene, maleic anhydride, itaconic anhydride and their fluorinated homologues (p. 0025 and cl. 10-11). It is the examiner's position that one of ordinary skill in the art would have been motivated by the teachings of Dammel to make a photoresist composition comprising a polymer having a monomer of structure 2 wherein R_7 or R_8 is $W(CF_3)_2OH$ and a monomer of maleic anhydride in order to make a polymer which has high transparency in the deep UV region (p. 0001). Furthermore, the claims clearly state that the copolymer contains additional *comonomers*. Therefore it would have been obvious to one of ordinary skill in the art to include more than one additional monomer of claim 11 such as a (meth)acrylate to make the taught composition. (see also p. 0025).

14. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dammel (US 2002/0187419 A1) as applied to claims 1-4 and 12-14 above and in further view of Allen et al. (US 6165678 A). Dammel fails to claim or exemplify a specific dissolution inhibitor. Dammel does however teach that typically dissolution inhibitors are added to the photoresist to decrease the dissolution rate of the unexposed photoresist in developer. Examples of known dissolution inhibitors that may be used are monomeric or oligomeric cholates (p. 0026). Allen et al. (US 6165678 A) teach that suitable dissolution inhibitors, which are known to those skilled in the art include t-butyl lithocholate, methyl lithocholate and the like (c. 9, l. 46-c. 10, l. 3). One of ordinary skill in the art would have been motivated to use any conventional and well known cholate as the dissolution inhibitor in the taught photoresist composition of Dammel such as those disclosed by Allen, which

includes t-butyl lithocholate and methyl lithocholate in order to decrease the dissolution rate of the unexposed photoresist in developer.

15. Claims 1-7 and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al. (US 2002/0004569 A1). Hatakeyama teaches a chemically amplified positive resist composition comprising (A) polymers comprising recurring units of a cycloolefin having fluorinated alkyl of the structure  (formula 1); (B) an organic solvent (see p. 0068); and (C) a photoacid generator. Preferred among the polymers of formula (1) are those represented by formulae (2)-1 to (2)-9 (p. 0018). It is the examiner's position that formulae  (2)-5 and  (2)-07 meet the limitations of claimed formula (7) and (8) when R^1_a is an acid labile group of taught formulae (3)-1 to (3)-9 (p. 0019-0020). In a preferred embodiment, the resist composition further includes a basic compound and/or a dissolution inhibitor (p. 0013). In another preferred embodiment, the inventive polymer comprises recurring units containing acid labile groups in addition to those of formula (1) (p. 0023). Suitable examples include  (7)-7,  (8)-7, and  (9)-7 (p. 0029, 0031, and 0033) wherein R^{13} is an acid labile group (p. 0026). The acid labile group represented by R^{13} is selected from a variety of groups, preferably from

among the groups of the formulas (12) and (13), tertiary alkyl group with 4-40 carbon atoms (14), trialkylsilyl groups whose alkyl groups each have 1-6 carbon atoms and oxoalkyl groups of 4-20 carbon atoms (p. 0039-0056). It is the examiner's position that formulas (7)-8 and (9)-7 meet the limitations of claimed formula (2) and taught monomer (8)-7 meets the limitations of claimed formula (5). Hatakeyama further teaches that when copolymers comprising units of formula (1) and acid labile group containing units are prepared by polymerizing the corresponding monomers, there can be added an additional monomer. Specifically a monomer for improving adhesion, a monomer for improving dry etching resistance, and/or a (meth)acrylate monomer. The said adhesion improving monomer used herein is one selected from the group consisting of (17)-1 to (17)-29 (p. 0057). Specifically monomer (17)-2 is maleic anhydride. One of ordinary skill in the art would have been motivated by the teachings of Hatakeyama to make the preferred copolymer which comprises recurring units of given formula (1) such as formula (2)-5 or (2)-7 and an additional recurring units such as formula (7)-7, (8)-7 or (9)-7. Additionally one of ordinary skill in the art would have been motivated to incorporate a monomer of formula (17), specifically (17)-2 into the said copolymer in order to improve the adhesion of the taught composition.

Hatakeyama teaches that the preferred photoacid generators are onium salts, diazomethane derivatives, and glyoxime derivatives (p. 0086). The basic compound is preferably a compound capable of suppressing the rate of diffusion when the acid generated by the photoacid generator diffuses within the resist film. Suitable examples include primary, secondary, and tertiary aliphatic amines, carboxyl group bearing nitrogenous compounds, sulfonyl group bearing nitrogenous compounds, amide derivatives and imide derivatives (p.

0088-0090). The dissolution inhibitor is a compound, which changes it s solubility in an alkaline developer under the action of an acid. Examples include t-butyl adamantanecarboxylate, t-butyl cholate and t-butyl adamantaneacetate (p. 0102-0106).

One of ordinary skill in the art would have been motivated by the prior art teachings of Hatakeyama to make a composition comprising a copolymer having the preferred formula (7)-7, (8)-7 or (9)-7; a photoacid generator, a base compound and a dissolution inhibitor which has a high transmittance to vacuum UV radiation as well as improved negative conversion-preventing effect and dry etching resistance (p. 008).

Allowable Subject Matter

16. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter: review of the prior art failed to teach and/or disclose a monomer of formula (4) in combination with monomers (I) and (II) wherein formula (4) has a group -COO-C(R_7)$_3$ selected from the group presented in instant claim 8.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Ito et al. (US 2002/0102490 A1) pertaining to substituted norbornene fluoroacrylate copolymers and use thereof for lithographic photoresist compositions.
- Brock et al. (US 2002/0146639 A) pertaining to lithographic photoresist compositions and processes for their use.

- Dammel et al. (US 6486282 B1 and US 2003/0013831 A1) pertaining to polymers suitable for photoresist compositions.
- Harada et al. (US 6511787 B2) pertaining to polymers, resist compositions and a patterning process.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

21. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

Yvette C. Thornton

Yvette Clarke Thornton
Junior Examiner
Art Unit 1752

yct
February 24, 2003